LEAVES FROM A COLLECTOR'S NOTE BOOK

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With one text figure

Gainesville, Fla., April 6, 1931.

THE UPLANDS about Ocala, where we began collecting today, are covered for the most part with a deposit of fine sand overlying the soft porous limestone, which latter deposit is quarried extensively here for road building. These sandy uplands support a mixed growth of Pine (*Pinus echinata* and *P. caribaea*) and of deciduous species, amongst which are *Carya alba*, *Quercus laurifolia*, *Q. cinerea*, *Q. rubra*, *Q. Chapmanii*, *Q. stellata* var. *Margaretta*, *Diospyros virginiana*, *Crataegus constans*, *C. amica*, *C. inopina*, *Rubus cuneifolius*, *Prunus umbellata*, *Rhus quercifolia*, *Ceanothus microphyllus*, *Asimina speciosa*, and *Viburnum rufidulum*. In dryer places this gives place to a more stunted growth, largely of shrubby species, locally known as scrub, in which *Quercus Catesbaei*, *Q. myrtifolia*, and *Q. cinerea* are often common, with *Xolisma ferruginea*, *X. lucida*, *Osmanthus americana* and sometimes *Pinus clausa*. Many interesting herbaceous plants grow here also, of which *Lupinus diffusus* is one of the most common and conspicuous.

Most of the *Crataegus* of the open upland woods, including the three species mentioned above, belongs to the very distinct *Flavae* group, and the trees have a strange appearance with their generally stiff, recurved, branches, slender drooping branchlets, and trunks covered with thick black bark, that is deeply fissured and divided vertically and horizontally, having much the appearance of that of the Flowering Dogwood.

We drove out in the forenoon to the Ocala National Forest, and as we reached the lowlands and flood plains along the Oklawaha River, which we crossed near Silver Springs, it was interesting to note the sudden change in the character of the forest. Cabbage Palmettos growing amongst the Pines, just before we reached the river, looked strangely incongruous.

The soil of the river valley is stiff and black and largely calcareous. The Pines disappear and give place to *Taxodium distichum*, *Quercus nigra*, *Ulmus floridana*, *U. alata*, *Celtis laevigata*, *Crataegus viridis* and *Fraxinus profunda* var. *Ashei*,[1] with *Rhus Toxicodendron*

[1] **Fraxinus profunda** var. **Ashei**, var. nov.

A typo differt foliolis glabris vel raro secus nervos parce tomentosis, sepalis minoribus 1–1.5 mm. longis.

A slender tree 10–12 m. tall, with ascending branches and trunk up to 3–4 dm. in diam. Bark rough and deeply furrowed. Leaves ovate-lanceolate in outline, 1.5–3.5

and *Sabal glabra* amongst the undergrowth. Some of the dwarf Palmettos here were nearly two meters tall. A few trees of *Quercus Shumardii* were seen growing just above the swampy flood plains.

In the afternoon we stopped just north of the boundary of Alachua County, near the village of Micanopy, to examine the *Crataegus*, of which several species were in bloom. Besides *Crataegus egens* and *C. Brittonii*, another species was abundant, which from the characters of the flowers and leaves apparently belongs to the *Parvifoliae* or *Uniflorae* group, but differs in habit from most of them, as it becomes a small spiny tree 3–4 m. tall. The flowers are single or two or three together and have 20 stamens, yellow anthers and 5 styles, as in *C. uniflora*, and also have the large conspicuously glandular-serrate calyx lobes of that group.

dm. long; leaflets 5–9, usually 7, ovate-lanceolate or lance-elliptic, cuneate or rarely rounded at base, acuminate at apex, usually entire, petiolules of the lateral leaflets 5–15 mm. long, those of the terminal leaflet 2–5 cm. long, glabrous or rarely with tufts of brown tomentum along midrib and principal veins; fruit in ample panicles, 5–18 cm. long; samaras flattened, spatulate-lanceolate or linear-lanceolate, 3.5–6 cm. long, 0.6–1 cm. wide, obtuse, rounded, or retuse at apex, longitudinally striate on wings and less conspicuously so on body of seed on which the wing is decurrent to the middle or below; fruiting calyx narrowly campanulate 4–5 mm. long including the ovate-lanceolate calyx-lobes, which are 1–1.2 or rarely 2 mm. long.

This small tree, which inhabits the wet river swamps of the coastal plain from Maryland to Florida, seems to be intermediate between *Fraxinus caroliniana* and *F. profunda*, with both of which specimens have been confused. Specimens in the herbarium of Arnold Arboretum, from the Apalachicola River, Florida, have the young branches and leaves densely pubescent as in typical *Fraxinus profunda* to which they are correctly referred, but I have seen specimens from River Junction, Florida, in which the mature leaves are glabrous, and other specimens appear to be intermediate, and for this reason I think it better to regard the glabrous or sparsely pubescent form as a variety of *F. profunda* rather than a distinct species.

My attention was first called to this tree by Mr. W. W. Ashe, for whom the variety is named, and on whose notes and collections I have drawn to supplement my own made this season in the region where it grows.

Maryland: Dorchester Co., *J. A. Cope*, Sept., 1923; eastern shore, *G. Beasley*, June 20, 1922; Potomac River swamps, s. of Washington, *W. W. Ashe*, Sept. 18, 1927. Virginia: Alexander Island, Alexandria Co., *W. W. Ashe*, nos. 1, 6, and 7, Sept. 18, 1924; near Alexandria, *Jos. H. Painter*, no. 912, Aug. 9, 1904. North Carolina: On Brogaw River, near Northeast Cape Fear River, Pender Co., *W. W. Ashe*, Oct. 30, 1928; Pender Co., *E. J. Palmer*, no. 38256, March 28, 1931; Raleigh, *W. W. Ashe*, no. 1008, Oct. 10, 1895; Hillsboro Road, Raleigh, *J. G. Ashe*, April 20, 1924. Georgia: Athens, *J. H. Miller*, no. 103, Sept. 1923. Florida: Santa Fe River, Alachua Co., growing in water, *W. W. Ashe*, June 4, 1892; near Hildreath, *W. W. Ashe* (**type**) May 15, 1929; between Ft. White and Hildreath, *W. W. Ashe*, June 4, 1929; Oklawaha River swamps, Marion County, *W. W. Ashe*, April 26, 1923; between Ocala and Sulphur Springs, Marion County, *W. W. Ashe*, April 14, 1923; River Junction, without date, *W. W. Ashe;* Kissimmee, Osceola County, *E. J. Palmer*, no. 38356, April 2, 1931; low swampy woods along Oklawaha River, near Silver Springs, Marion County; *E. J. Palmer*, no. 38404, April 6, 1931; low wet woods, near St. Marks, Wakulla County, *E. J. Palmer*, no. 38507, April 10, 1931. Indiana: in a pond about 2 miles n. of Brownstown, *C. C. Deam*, no. 11987, Aug. 8, 1912; very sandy soil, low woods, n. shore of Bass Lake, Starke Co., *C. C. Deam*, no. 17916, Aug. 19, 1915; very low place in White River bottoms 3.7 miles e. of Mendora, Jackson Co., *C. C. Deam*, no. 19038, Sept. 13, 1915; on an old beach line, n. side of Bass Lake, Starke Co., *C. C. Deam*, no. 21063, Aug. 22, 1916; low place along roadside, 4 miles s. of Columbus, Bartholemew Co., *C. C. Deam*, no. 30251, Sept. 27, 1919. Missouri: Campbell, *B. F. Bush*, nos. 436, Aug. 15, 1895, 6596, April 19, 1912. Louisiana: Harvey's Canal, New Orleans, *R. S. Cocks*, no. 30, April, 1902.

Tallahassee, Fla., April 7th.

Our first stop this morning was a few miles south of Gainesville, where *Crataegus* was abundant and several species were in bloom, growing in deep fine sands. The species collected in the thickets and along the border of open woods here were *C. integra*, *C. impar*, *C. fortis*, *C. adusta* and *C. gregalis ?*, as well as the *Parvifoliae* species, like the one we saw at Micanopy yesterday. Here also it becomes a small pyramidal tree, 4–5 m. tall, with intricate spiny branches.

Near Bronson *Xolisma lucida* was growing in a small swamp filled with the Pond Cypress, and some of the specimens were 4–5 m. tall.

In sandy upland woods near Chiefland, Levy County, *Crataegus amica* and *C. egens* were in bloom, and in burned over ground there were large patches of *Castanea alnifolia*, both sterile and fruiting, none of them more than 3–5 dm. tall.

About noon we crossed the Suwannee River at Old Town and stopped on the west side for lunch and to work the collections. *Betula nigra* is growing on the river banks here. The leaves appear to be small and unusually thick for the species, but it can scarcely be more than a geographical form. *Viburnum obovatum* was also collected here in young fruit, but with a few clusters of flowers still remaining. It is a small tree here, the largest specimens being 6–7 m. tall. *Quercus lyrata*, *Q. stellata* var. *Margaretta*, *Acer rubrum* var. *Drummondii* and the curious little Cycad, *Zamia floridana*, were also collected, and I photographed a fine clump of *Lupinus villosus* in sandy soil along the river bank.

April 10th.

This morning, accompanied by Dr. Harper and a local ornithologist we set out to visit the old town of St. Marks, near the mouth of the River of the same name, where a good deal of botanical collecting has previously been done. About ten miles south of Tallahassee we stopped in a bit of flat pine woods to examine a colony of broad leaved trees and shrubs occupying a little depression or hammock. A large tree of *Cornus florida* was in bloom here. The trunk below the first fork, which was only about a meter and a half above the ground, was over 3 dm. in diameter, and the height of the tree, though not measured, must have been 9 or 10 meters. A little further on we found *Crataegus viridis* quite abundant in low wet woods and in the sandy soil on higher ground we collected *Bumelia reclinata*, which was here a shrub about a meter high.

Near Newport, on the St. Marks River, the Florida Elm (*Ulmus floridana* Small) is abundant in the low wet woods. This tree, although closely related to *Ulmus americana*, has quite a distinct ap-

pearance on account of the conspicuously buttressed bases of the trunks and its small leaves. Some of the trees had a curious appearance from the markings caused by woodpeckers, which for some reason that I am unable to explain encircled the trunks in bands at rather regular intervals, giving them a sort of jointed appearance. We had lunch here at the picnic grounds and afterwards explored the woods, collecting *Juniperus lucayana* and *Viburnum scabrellum*, and in shallow muddy ponds the little Quillwort, *Isoetes flaccida*. Some of the native trees, as well as the Pecans cultivated about the town, were well loaded with great clusters of Mistletoe (*Phoradendron flavescens*), and I secured a photograph of one of these.

A *Crataegus* of the *Crus-galli* group was abundant in the open parts of the swampy woods, and I examined many of them here as well as others later in the day about Wakulla and St. Marks. The type of Sargent's *Crataegus limnophila*[1] came from St. Marks, and it is described as having flowers on slightly villous corymbs and 15–20 anthers of dark rose-color. Some of the trees observed here quite agree with the description in these and other respects, but others growing with them, quite identical in habit, foliage, bark, fruit and other characters, have the flowering corymbs in some cases quite glabrous, and there appeared to be a complete gradation from these to others in which the branchlets and petioles as well as the corymbs and hypanthiums are copiously villous. The flowers of all the trees examined here have 15–20, mostly 20 stamens and red anthers, but specimens collected a few days later at Chattahoochee have only 10 stamens, and slightly villous corymbs. By comparing these specimens with the glabrous species described from Florida by Beadle as *Crataegus pyracanthoides*[2] said to have 7–10 stamens and red anthers, it seems evident that they are both forms of one species, as there is a very clear identity in the foliage, flowers and fruit and all other characters except pubescence and variation in the number of stamens. It seems clear, therefore that these should be regarded as only varieties of one species, and the glabrous form, usually with 10 stamens, but sometimes as many as 20, should be known as *Crataegus pyracanthoides* Beadle, while the form with corymbs and sometimes foliage and branchlets more or less villous becomes *C. pyracanthoides* var. **limnophila** (Sarg.), comb. nov.

This also shows how impracticable it is to maintain the group distinction made by Beadle between *Crus-galli* and *Berberifoliae*, based merely on pubescence.

[1] Jour. Arnold Arb. III. 3 (1922).
[2] Biltmore Bot. Studies, I. 136 (1902).

About the old town of St. Marks, lower down the river, both the pubescent and the typical varieties of this *Crus-galli* species are even more abundant, and in addition I collected here *Crataegus integra*, *C. amica*, and *C. assimilis*. The Honey Locust (*Gleditsia triacanthos*) is growing in the swampy woods here and some of the trees examined have unusual bark for this genus, that on the old trunks being dark, thick, and very rough, with fissures and ridges divided into short blocks, much as in *Cornus florida* or *Diospyros virginiana*. I photographed the trunk of one tree with this sort of bark, and I think that no one familiar with the typical appearance of this tree farther north would recognize it. However, I can find no differences in the fruit, flowers or foliage to justify regarding it as distinct.

April 11th.

The Apalachicola River, which crosses the western part of Florida is formed by the junction of the Chattahoochee and Flint Rivers, just north of the state line, in Georgia. In this part of Florida it has cut its channel deeply through beds of soft Tertiary limestone, developing in places distinct bluffs and ecological and soil conditions quite different from those of other parts of the state, which accounts for the very interesting and distinct flora. We drove out today with Dr. R. M. Harper and a party of geologists from the State Geological Survey, our objective being Allen Bluff in Liberty County. This is one of the highest bluffs of the coastal plain and it is perhaps the highest in Florida. The precipitous part of the cliff which extends for perhaps half a mile along the river, is formed of horizontal strata of limestone and marl. In places it is quite perpendicular but on the slopes there is an abundant growth of trees and shrubs. The soil on the highest levels above the bluff is of deep sand, but ravines cutting through this have penetrated the calcareous beds, and these support a rich growth of both woody and herbaceous plants. Several small trees of the Tumion (*Torreya taxifolia*) were seen here, and amongst other woody plants were *Hamamelis macrophylla*, *Styrax grandifolia*, *Asimina parviflora*, *Stuartia malacodendron*, *Hydrangea quercifolia*, *Quercus austrina*, *Illicium floridanum* and *Celtis pumila* var. *georgiana*. The Christmas fern was also abundant here as well as other ferns. Some large trees of *Populus balsamifera* var. *virginiana* were growing along the lower part of the bluff. In the sandy open woods above, we collected *Ptelea trifoliata* var. *mollis*, *Clinopodium carolinianum* and *Trichostema suffruticosum*, besides several sorts of *Crataegus*, amongst which were *C. integra*, *C. condigna* and *C. armentalis*, besides a small tree of the *Parvifoliae* group, resembling that found near Gainesville, and probably identical with it.

On the return trip our car separated from the rest of the party and took a more northerly route, where following a weatherbeaten and misleading sign, we came out into a piece of deeply rutted sandy country road at places almost impassable and where some of the dilapidated wooden bridges across the streams looked quite dangerous. Before venturing across two or three of the worst of these we stopped to reinforce them by laying loose planks lengthwise for running boards. In the deep sands by the roadside after getting over the worst of this we stopped to collect a little shrub that was in full bloom and very showy with its profusion of violet or purplish flowers. This proved to be *Conradina canescens*, of the Mint family, or a related form somewhat intermediate between that species and *C. puberula*.

April 12th.

This morning we drove out several miles north of Tallahassee, on the invitation of Mr. Goode, manager of the Horseshoe Plantation, to look at a Crataegus tree there. The tree standing near the manager's house is a large symmetrical specimen, about 12 meters tall at a rough estimate. The low conical crown is formed of numerous slender wide-spreading branches, and slightly zig-zag branchlets, unarmed or with a very few slender spines. Most of the flowers were gone, but I secured a few belated ones in which the anthers were still unopened. There was an abundance of last season's fruit under the tree. From a study of this material and other specimens in the herbarium of the Arnold Arboretum it appears to belong to the *Ignavae* group of Beadle, which is closely related to if not a part of the large *Flavae* group. And it seems to be quite distinct from any described species.

A description of this species is given below under the name *Crataegus leonensis*,[1] sp. nov. As contrasted with *Crataegus ignava*,

[1] **Crataegus leonensis,** sp. nov.

Arbor ad 10–12 m. alta; truncus interdum 3–4 dm. diam., cortice profunde rimoso fusco-cinereo vel fere nigro; ramuli graciles, flexuosi, sparse spinis 3–5 cm. longis subvalidis armati. Folia ovata, rhombica vel obovata, 2–4.5 cm. longa, 2–4 cm. lata, glabra, papyracea sed firma, breviter lobata, grosse dentata, apice acuta, basi acuta vel in petiolum 1–2.5 cm. longum glandulosum attenuata. Folia ramulorum novellorum ovata vel sub-rotunda ad 6 cm. longa lataque, basi obtusa, rotunda vel fere truncata. Inflorescentiae compactae, 3–7-florae; flores 1.6–2 cm. diam.; stamina 20; antherae roseae; styli 3–5, plerumque 4; pedicelli breves, 8–14 mm. longi, sparse villosi; calyx sparse pubescens; sepala lanceolata vel lineari-lanceolata, 4–5 mm. longa, 1–1.5 mm. lata, manifesto glanduloso-serrata, extus glabra, intus glabra vel parce pubescentia. Fructus subglobosus, 9–12 mm. diam., rubro-aurantiacus vel rubro-brunneus, lenticellis maculatus; calyx prominens, cavo profundo, columno stylari 1–2 mm. alto; pyrenae 3–5, crassae, 7–8 mm. longae, 4–5 mm. latae, extremis obtusis, dorso sulcato.

A tree 10–12 meters tall, with depressed round top and wide-spreading intricate branches. Trunk up to 3–3.5 dm. diameter, clothed with thick, ridgy, dark gray or nearly black bark. Branchlets slender, zig-zag, sparingly armed with stoutish spines, 3–5 cm. long. Leaves glabrous except for a few short villous hairs along midrib and

it is a larger tree, much less spiny, with larger, thinner leaves which are more coarsely serrate on the margins and often broader

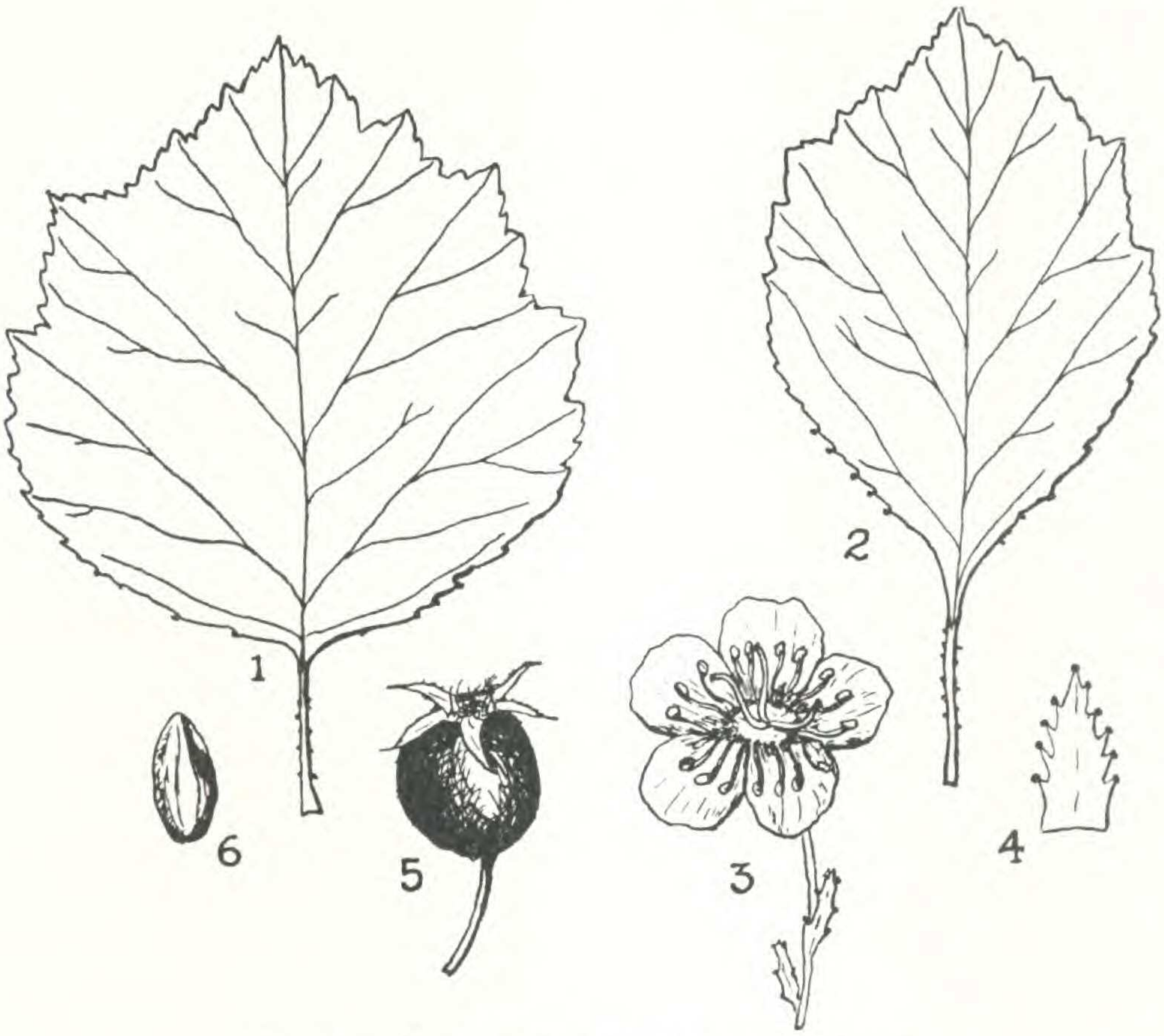

FIG. 1.—CRATAEGUS LEONENSIS Palmer

at the base. The fruit is also firmer. The leaves are thinner and larger than in most species of the *Flavae* group, and are quite veins on upper surface when young, soon entirely glabrous, thin but firm, ovate, rhombic or obovate in outline, 2–2.5 cm. long, 2–4 cm. wide, coarsely dentate and with 2–3 pairs of obscure lobes above the middle, with stout midrib and 3–5 pairs of primary veins, slightly impressed on upper surface, acute at apex, cuneate or attenuate at base and more or less decurrent on the slender, glandular petioles, which are 1–3 cm. in length; on vigorous shoots, broadly ovate to suborbicular in outline, up to 6 cm. diam., obtuse, rounded or rarely truncate at base. Flowers 1.6–2 cm. in diam., in compact 3–7-flowered corymbs, on slightly villous pedicels 8–14 mm. long; stamens about 20; anthers rose or pink; styles 3–5; calyx and ovary slightly villous; calyx-lobes lanceolate or linear-lanceolate, conspicuously glandular-serrate, glabrous without, glabrous or sparsely pubescent within; bracts numerous, linear or linear-spatulate, very glandular, soon deciduous. Fruit subglobose 9–12 mm. diam., single or in few-fruited, erect or spreading clusters, orange-red or russet when fully ripe, or often green mottled with irregular lenticels of russet color; flesh thin, firm, becoming mellow; fruiting calyx rather prominent with wide deep cavity and column 1–2 mm. high, with persistent or tardily deciduous sepals. Nutlets 3–4 or rarely 5, thick and rounded at the ends, plane on the ventral surface and with prominent rounded ridges and two or three shallow grooves on dorsal surface.

Middle and western Florida, growing in sandy open upland woods.

FLORIDA: Horseshoe Plantation, near Tallahassee, *C. S. Sargent*, March 28, 30, 1914; *T. G. Harbison*, no. 2, Sept. 16, 1919, nos. 5645, 5646, April 6, 1920, no. 5645a, Oct. 6, 1920, nos. 6071, 6072 (**type**), April 3, 1923, nos. 6181, 6182, Sept. 27, 1923; *E. J. Palmer*, no. 38557, April 12, 1931.

similar to those of some of the *Rotundifoliae* species. The rough dark bark and conspicuously glandular petioles, as well as its geographical range, indicate, however, that it properly belongs with the southern *Flavae* group.

Mr. Goode later drove us about the plantation, and I saw several other specimens of this proposed species growing in the sandy open upland woods. Other species of *Crataegus* also found here were *C. adunca*, *C. assimilis* and *C. consanguinea*.

In the afternoon Mr. McDougall and I drove out to Wakulla Springs, where I was surprised to find the Washington Thorn (*Crataegus Phaenopyrum*) growing in the low woods. This species has not previously been known as far south as Florida, so far as I know. In the sandy woods, on higher ground in this vicinity we also collected *Crataegus abstrusa*, *C. clara* and *C. consanguinea*, and two or three other as yet unidentified species.

De Funiak Springs, Fla., April 13th.

Læaving Tallahassee this morning, after taking leave of our friends at the State Geological Survey, where we have been making our headquarters, and accompanied by Dr. R. M. Harper, who plans to accompany us as far as Birmingham, Alabama, we turned west and made our first stop at Chattahoochee, just south of the Georgia boundary.

The geological formation here is a rather pure Tertiary limestone, which forms bluffs and steep hillsides along the river and deep wooded ravines leading down from the uplands. The rich limestone soil and humus accumulated along the slopes and in the valleys supports a rich and varied flora, in places quite suggestive of northern woods, but with a mingling of southern plants.

The beautiful and rare Tumion (*Torreya taxifolia*) attains its best development here. This remarkable tree, a relic of the wide distribution it had in an earlier geological period, is represented in America by this species, confined to a narrow belt in Florida and Georgia, and another (*Torreya californica*) on the Pacific coast. In the Old World there are four species in eastern Asia. The trees here were growing on steep hillsides and in the deep ravines. The largest specimen seen was perhaps 10 metres tall, with numerous spreading and ascending branches dividing about a meter above the ground. The trunk below the first branches had a diameter of 3 or 4 decimeters.

Along the river bluffs and ravines were also growing such familiar northern species as *Quercus alba*, *Ulmus fulva*, *Celtis laevigata*, and *Nyssa sylvatica*, and the low shrubby *Viburnum affine* var. *hy-*

pomolacum. The Columbine (*Aquilegia canadensis*) grows on cliffs and rocky ledges, and *Phlox pilosa* is abundant in the open woods. The most interesting discovery was the northern Prickly Ash (*Zanthoxylum americanum*), which I do not think has been reported from Florida before. *Acer leucoderme* is also abundant on the bluffs and *Crataegus spathulata* and *C. pyracanthoides* var. *limnophila* were found in the low woods along the river.

Elba, Ala., April 14th.

We left the camp at De Funiak Springs early this morning and drove out to the south and east, making our first stop at a crossing of Eucheeanna Creek. The soil here is a reddish loam and appears to be rather fertile. On a bank overhanging the creek we found the beautiful orange-flowered *Rhododendron austrinum* in bloom, and also an abundance of Mountain Laurel (*Kalmia latifolia*). This is the second locality in Florida in which I have seen both of these plants growing together, the other being along the Ocklocknee River in Gadsden County. *Cornus florida* was in bloom in the low woods, the flowers being the largest that I have ever seen, some of them having a breadth across the bracts of more than 12 cm. (4 inches).

A little farther south we got into a poor looking wooded country with hills and ridges dissected by deep ravines. We stopped to explore one of these where a spring flowed out producing a rank growth of ferns and flowering plants, with a great variety of trees and shrubs on the banks and along the little stream. Amongst the ferns were the Christmas Fern (*Polystichum acrostichoides*), Beech Fern (*Thelypteris hexagonoptera*) and Cinnamon Fern (*Osmunda cinnamomea*). The Beech (*Fagus grandifolia* var. *caroliniana*), *Magnolia pyramidata*, *Tilia floridana*, and *Amelanchier canadensis*, were growing on the ridges and banks, and farther down I collected *Viburnum densiflorum*, *Symplocos tinctoria*, *Stuartia malacodendron*, *Styrax grandifolia* and *Cornus alternifolia*.

After returning to camp and loading up our paraphernalia, we proceeded west to Crestview, where we turned south and were soon in the Florida National Forest. *Crataegus lacrimata* is abundant in the sandy open woods about De Funiak Springs and between there and Crestview. It has a very distinct and striking appearance, from the stiff recurved branches and slender pendulous branchlets with very small, spatulate, glabrous leaves, and abundant flowers in small clusters closely set along the branches. The bark is dark and thick, with the ridges curiously cross-fissured, dividing them into short blocks, as is common in this group. Some

of the trees attain a size of 8–9 meters, with trunk diameter of 2 dm. or more.

We were in search of a rare Oak described from this locality a few years ago by Mr. Ashe, as *Quercus caput-rivuli*, and later referred by him to *Quercus arkansana* var. *caput-rivuli*. We stopped for lunch at an abandoned ranger station in a clearing of the Pine woods. The pretty little *Phlox Hentzii* and *Lithospermum Gmelini* were growing in the sands here.

After finishing lunch and working the collections I set out to explore some ravines just back of the house. The fine sand here is underlaid by harder loam and clay, eroding rapidly into these deep ravines with steep or precipitous sides, that work their way back into the uplands. In one of these I soon came upon several specimens of the Oak I was looking for, some of them having acorns. The trees growing here, as well as some seen later in the day, some miles to the north, have straight ascending branches, forming slender pyramidal crowns, and with smooth pale bark. This gives them a rather different appearance from *Quercus arkansana* as it grows in Arkansas and Alabama, and although there is little in the foliage or fruit to distinguish them, it is perhaps best to regard the Florida trees as a variety.

Along these ravines I also collected *Illicium floridanum*, *Clinopodium coccineum* and *Prunus alabamensis*. The last has not, so far as I know, been found in Florida before, and has only been known from limited areas in Alabama and Georgia.

Between Niceville and Laurel Hill, not far from the Alabama line, I again saw *Quercus arkansana* var. *caput-rivuli*, growing in similar situations to the other station and of quite similar habit. *Crataegus lacrimata* was also abundant here, and the little legume *Lupinus Westianus*, was growing in the sandy woods. Along a little creek north of Laurel Hill and just before we crossed the state line, *Clifftonia monophylla* was abundant and in full bloom. Here also I collected *Ilex decidua* and a curious form of *Liriodendron Tulipifera*, the small leaves of which have short, rounded lobes.

Troy, Ala., April 15th.

Our first stop this morning was along a creek near Elba, where we stayed last night, and on the banks of the stream we found the orange-flowered Azalea (*Rhododendron austrinum*) in bloom. This seems to be a northward extension of the known range for this species, which has only been known previously from a few localities in Florida, I believe. The Mountain Laurel and shrubby Pawpaw (*Asimina parviflora*) were also growing here. Three miles north of

New Brockton we collected *Crataegus senta*, growing in open sandy woods. This was a good-sized tree, perhaps 7 meters tall, with the thick rough bark and recurved branches, characteristic of the *Flavae* group. *Crataegus calva*, growing near, has a somewhat similar habit, but was here a smaller tree, and it has larger, more showy flowers.

After passing through Enterprise, and near the west edge of Dale County, we stopped to collect in sandy open woods, and here were found *Crataegus lacrimata*, *C. lenis*, *C. attrita* and *C. gilva*. *Quercus Catesbaei* and *Q. stellata* var. *Margaretta* were also abundant here, and a low *Opuntia* was growing in the sand and nearby, along a little creek we found *Cornus alternifolia* and *Rhododendron canescens*. Near Ozark we added *Crataegus incilis*, and *C. opima* as well as *Bumelia lanuginosa* to our collection, and near Brundidge *Crataegus segnis* and *C. uniflora*.

About noon we reached the "pocosin," a locality that I had for many years been anxious to visit. After turning off the highway we found ourselves on a poor country road, and began plowing our way through the deeply rutted soft sand, which threatened to stall our heavily loaded car. After some maneuvering and a good deal of pushing we managed to get on and stopped for lunch at a primitive little school house on the edge of the woods.

The pocosin embraces an area of perhaps a hundred acres in the sandy uplands, and is traversed by several ravines and small streams which have their sources here. Although the surface deposit of fine nearly pure sand looks quite similar to that of the surrounding areas, which originally were occupied largely by Pine forest, it is well distinguished and its boundaries clearly defined by its rich and peculiar flora of small deciduous trees and shrubs, many of which are only found here in this part of the state. The cause of this marked difference in flora has not been explained, but the hypothesis suggests itself that it may be due to a difference in subsoil, causing the water content of the porous sand to be retained longer than in the surrounding areas, and giving rise to seepage spring along the ravines. Dr. Harper, who was with us and acting as guide, published a short, interesting account of the locality and a partial list of the plants in 1914.[1]

In the very hasty reconnaissance we had time to make it was not possible to get a complete list even of the trees and shrubs, but the following species were collected:

Carya pallida
Quercus alba var. latiloba
Quercus stellata var. araneosa
Quercus laurifolia

[1] Bull. Torrey Bot. Club, XLI. 209–220 (1914).

Quercus velutina
Quercus Catesbaei
Quercus marilandica
Quercus cinerea
Quercus rubra
Quercus arkansana
Rhododendron canescens
Crataegus Sargentii
Crataegus contrita
Crataegus bisulcata
Crataegus macilenta
Rhus canadensis
Aesculus discolor
Prunus umbellata
Acer floridanum
Tilia floridana
Osmanthus americana
Viburnum rufidulum

Quercus arkansana, which was collected here by Dr. Mohr many years ago, but which was not recognized as a distinct species until found by Bush on Red River, in southwestern Arkansas, and described by Sargent in 1911[1] was one of the particular objects of our quest. It is not at all rare here, although not so abundant as in the Arkansas station. I was impressed with the absolute and unmistakable identity of the species in these two widely separated localities as well as the close similarity of soil and ecological conditions under which they grow. There can be no reasonable doubt as to the distinctness of this species, which is one of rarest and most interesting of the American Oaks.

Selma, Ala., April 16th.

We passed through a section of hilly country in Wilcox County, this forenoon, where *Magnolia macrophylla* is quite abundant in open woods along the streams. In Marengo County we crossed a section where a Cretaceous limestone comes to the surface, and the influence of the calcareous soil was plainly seen in the change of flora. Pines were absent here and *Juniperus virginiana* was the only Conifer on the uplands. *Quercus Muhlenbergii* and *Q. Durandii* are characteristic trees in the glades and on the hills. *Crataegus Ashei* was in bloom in the glades. As it grows here it is a very spiny shrub about 3–4 meters tall, with large, handsome flowers. Along the bluffs of Pine Barren Creek, a little farther on Dr. Harper showed us *Dirca palustris* growing along a north-facing bluff.

Near Berlin, Dallas County, we crossed another limestone area and again found *Crataegus Ashei* as well as *C. concinna* and *Rhamnus lanceolata* in the glades and thickets. *Crataegus insidiosa* and *C. frugiferens* as well as an unknown species of the *Pruinosae* group were growing along small streams.

Birmingham, Ala., April 18th.

Dr. H. A. Wheeler, Curator of the Birmingham Museum, who has been our host here, guided us out today to the interesting

[1] Trees & Shrubs, II. 121 (1911).—See also Palmer, E. J. in Jour. Arnold Arb. VI. 195–200 (1925).

locality on Shades Mountain, several miles from Birmingham. I had visited this place with him previously, but was glad of an opportunity to explore it more fully.

There is a scenic road which we followed up the mountain along a line of sandstone cliffs. *Pinus virginiana*, *Quercus marilandica*, *Castanea dentata*, *Celtis pumila* var. *georgiana*, *Amelanchier canadensis* and *Crataegus regalis* were amongst the trees noted here. There are also many interesting herbaceous plants which we did not have time to collect. *Silene Wherryi* and *Senecio plattensis* were conspicuous in the rocky woods. Several ferns are found along the cliffs, one of the most interesting of which is *Asplenium pinnatifidum*, growing in shaded clefts, although it did not appear to be abundant. Besides the Pennsylvanian sandstone, which is found at the lower levels, igneous rocks occur in many places.

At one point where we stopped and spent some time in exploring and collecting, a little stream, Lost Creek, flows across an outcrop of granite and other igneous rocks, which form glades or barrens several acres in extent, and have a distinct and most interesting flora. Over the more exposed parts the vegetation is sparse and consists of mosses, lichens and herbaceous plants, with shrubs and stunted trees that have established themselves in clefts and broken places as well as more abundantly along the rocky margins of the stream.

The rare and pretty little *Dimorpha cymosa* grows in large patches on thin soil of shallow depressions in the granite. *Cheilanthes lanosa*, *Arenaria brevifolia* and *Coreopsis crassifolia* also grow abundantly in the open places. Amongst the woody plants found in the barrens and along the creek are *Quercus Boyntoni*, *Q. georgiana*, *Celtis pumila* var. *georgiana*, *Xanthorrhiza apiifolia*, *Philadelphus hirsutus*, *Amelanchier canadensis*, *Aronia arbutifolia*, *Prunus alabamensis*, *Malus bracteata*, *Crataegus ignava*, *C. venusta*, *Ptelea trifoliata* var. *pubescens*, *Acer rubrum* var. *tridens*, *Oxydendron arboreum*, *Vaccinium sericeum*,[1] *V. vacillans*, *V. tenellum*, *Rhododendron arborescens*, *R. canescens* and *R. alabamensis*.

Quercus georgiana, which is locally abundant, has not before been known from Alabama, and only from the type locality at Stone Mountain, Georgia, and vicinity. It is usually a stout straggling shrub 2–4 meters tall as it grows here, but in better soil in the edge of open woods it sometimes becomes a small tree up to 6–7 meters tall, and with a trunk covered with dark, ridgy,

[1] **Vaccinium sericeum** (Mohr), comb. nov.
Vaccinium melanocarpum [var.] *sericeum* Mohr in Contrib. U. S. Nat. Herb. VI. 658 (Pl. Life Ala.) (1901).
Polycodium sericeum C. B. Robinson in Torr. Bull. XXIV. 570 (1912).

bark. Boynton's Oak (*Quercus Boyntoni* Beadle, or *Q. stellata* var. *Boyntoni* Sargent) is also fairly abundant in the barrens and it is also a shrub 1–3 meters tall. *Vaccinium sericeum* is conspicuous when in bloom on account of its very large flowers, perhaps the largest of any species of the genus. *Prunus alabamensis* is a shrub up to 2–3 meters tall, and it seems to be confined to the rocky glades and creek banks here. *Kalmia* is abundant along the rocky ledges and margins of the creek, and *Rhododendron arborescens*, not yet in bloom, and *Xanthorrhiza apiifolia* were found lower down the creek, where *Cheilanthes tomentosa*, *Thelypteris asplenifolia* and *Tradescantia hirsuticaulis* were also collected. *Rhododendron canescens* and *R. alabamense* were growing abundantly on banks a little above the creek and glades. The latter is rather a rare species and is distinguished by its glabrous winter buds. Over most of the mountain and surrounding region the forest is of larger growth and of mixed stands of Pine (*Pinus echinata*, *P. taeda*, *P. palustris* and *P. virginiana*) and deciduous species, in which Oaks, Hickories, Maple and Ash predominate.

Tupelo, Miss., April 21st.

We came into the little county seat town of Hamilton in a steady rain yesterday evening, and chanced to stop for lodging at a house nearly opposite the district Agricultural High School. After having had supper at the restaurant I talked to our host, a Mr. Love, and explained to him the object of our trip. He proved to be an interesting man, a native of Cape Cod, who had wandered over a good part of the world, and was fond of nature and out-of-doors life. He was much interested in our work and offered to guide us the following morning to some places that he knew, where he thought we would find good collecting.

Accordingly we set out early and after a short drive turned off the highway, near the site of the old town of Pikeville, which flourished in the days before the coming of the railroads. After travelling as far as we could over a rough mountain road we left the car and walked over to Dugan Creek, a small stream that has cut its channel through sandstone beds, which form cliffs and overhanging ledges along its course. On the rocky banks and along the cliffs I noted *Fagus grandifolia*, *Magnolia acuminata*, *M. macrophylla*, *Rhododendron alabamense*, *Corylus americana* and *Tsuga canadenis*, a curious mixing of northern and southern species. The Hemlock is locally abundant here and some of the trees are of a large size. It has been recorded from several other stations in Alabama by Dr. Harper and others. Ferns were abundant, the

following species were noted and collected here: *Osmunda Claytoniana*, *Thelypteris noveboracensis*, *Adiantum pedatum*, *Asplenium pinnatifidum* and *Trichomanes Boscianum*. Several colonies of the *Trichomanes* were found under the overhanging ledges of sandstone where the surface was kept permanently wet by seeping water and where direct sunshine penetrated only for a brief time each day. The fern-like moss, *Fissidens polypodioides*, was growing very luxuriantly with the fern, as well as several other mosses and liverworts.

Holly Springs, Miss., April 22nd.

We drove back several miles this morning to investigate some thickets of *Crataegus* that we noticed yesterday evening, but which we did not then stop to examine on account of the rain. The hills here are calcareous, underlaid with a soft Cretaceous limestone, and *Crataegus* is rather abundant. We stopped at two localities between this place and the little town of Mooresville and found what I take to be *C. tersa*, *C. macra*, *C. frugiferens*, *C. amnicola*, *C. biltmoreana* and *C. apiifolia*, the last growing in low ground along a creek. A species of the *Crus-galli* group was also abundant. It is a small, moderately spiny tree, with slightly villous branchlets and corymbs. It was in full bloom and I secured good specimens, but do not recognize it and suspect that it may be an undescribed species. *Malus angustifolia* was also common and in full bloom in the thickets, and I also found here the little Adder's tongue *Ophioglossum Engelmannii*. Along the banks of the creek near Mooreville the *Malus* was also abundant, and I found *Castanea pumila*, *C. dentata*, *Amelanchier canadensis* and *Rhododendron canescens* var. *subglabratum* along the same stream.

Going back through Tupelo we turned aside to visit a Negro Industrial School, near Okolona, in which the father of my travelling companion had long been interested. We found the wife of the president in charge, apparently a very capable and energetic woman. After visiting several of the buildings, including class rooms, shops and the president's house and seeing the students at lunch in the dining hall, we took a hasty departure, favorably impressed by the rather pathetic, though heroic effort being made to carry on the difficult work of Negro education here with inadequate equipment and in the face of local indifference and hostility.

Between Tupelo and Okolona there is some botanically interesting country. The soft marly limestone comes to the surface in many places, and large fossil oyster shells are abundant. *Crataegus Ashei* is frequent in the thickets as well as the unknown *Crus-galli* species seen near Mooreville. A patch of *Cercis canadensis*, in

which the plants were all shrubby and not more than 2–3 m. tall, had the leaves more than half grown but still retained clusters of flowers on many of the branches.

Sikeston, Mo., April 23rd.

After crossing the Mississippi at Memphis this morning we followed the highway which is built through the wide alluvial valley, making our first stop north of the town of Marion, Arkansas. *Crataegus* trees in full bloom in the low partly cleared woods attracted out attention. On investigation they all proved to be *C. viridis*, which is one of the commonest species of the valley, ranging from the Gulf to northeastern Missouri. I also collected here *Quercus prinus*, *Ulmus crassifolia* and *Ilex decidua*, which last was in bloom and with leaves nearly fully grown but retaining a full crop of bright red berries from the previous year. I remember having found it similarly retaining the fruit a few years ago, near Salisaw, Oklahoma, and from specimens in the herbarium of the Arboretum it would seem that this is not unusual in the southern part of its range.

In the afternoon we made a stop in the lowlands of Pemiscot County, Missouri, near Hayti. Such typical species of the swamps and lowlands as *Taxodium distichum*, *Arundinaria macrosperma*, *Populus heterophylla*, *Planera aquatica*, *Catalpa speciosa*, *Fraxinus profunda*, *Forestiera acuminata* and *Bumelia lycioides* were growing here. *Catalpa* is fairly abundant and is native here. The southern *Bumelia* is rare so far north and I have only seen it at one other station in Missouri, near Neelyville, Butler County.

Cape Girardeau, Mo., April 24th.

This morning we crossed Crowley's Ridge, just west of the town of Campbell, Mo., and stopped for a few minutes to examine the flora. This remarkable bit of relief, surrounded on all sides by the lowlands of the valley, extends along the great river, which at one time is supposed to have flowed to the west of it, from Stoddard County, Mo., to Helena, Ark., some fifty miles below Memphis. In places it rises to a height of more than 100 meters above the surrounding lowlands. The formation consists largely of unconsolidated beds of sand, gravel and clay, with loess becoming more common towards the southern end. It was originally and still is in many places covered with a forest of deciduous trees, including several eastern species which reach their western limit here, and with a flora, rich both in woody and herbaceous species, and very different floristically from that of the surrounding country. Conifers and *Ericaceae* are almost entirely absent, although I remember

seeing a few trees of *Pinus echinata* that had invaded the gravelly hills near Jonesboro, Ark., and the Tree Huckleberry, *Vaccinium arboreum*, is found rarely in the same vicinity. Several species of Oaks, Hickories, Black and Sweet Gum, Beech, Tulip-tree, Elms, Maple, Linden and Ash are the commonest forest trees, with several species of *Prunus*, *Crataegus*, *Malus*, *Viburnum*, *Hydrangea* and other shrubs as undergrowth or in more open places.

The only thing of especial interest found at this place today was a *Crataegus* that may be a hybrid between *C. viridis* and a species of the *Crus-galli* group.

Later in the day we stopped in the outskirts of Poplar Bluff to have a look at *Quercus coccinea* var. *tuberculata*, which with the typical form is found locally on the gravelly hills.

Fredericktown, Mo., April 28th.

Leaving our camp at Cape Girardeau this morning we stopped to examine a bit of low swampy woods, about two miles east of Delta and just before crossing into Bollinger County. This is a remnant of the fast disappearing dense and luxuriant forest of typical coastal plain composition, that formerly covered the lowlands and swamps of this part of the Mississippi valley, extending as far north as the mouth of the Ohio and the Wabash rivers. Lumbering, clearing and drainage have made rapid inroads, and almost the last vestiges of it seem doomed to disappear as the region is being rapidly transformed into a fertile farming section. I have been particularly interested in trying to trace the northern boundaries of this lowland forest and the limits of some of the typical species, where they touch upon the foot-hills of the Ozarks and suddenly disappear.

The forest here had been lumbered some years ago and the land partly drained, but water stands upon much of it in rainy seasons and a second growth is springing up rapidly. The Pumpkin Ash (*Fraxinus profunda*) was common here but nearly every tree had been cut for lumber. Sprouts about the stumps are already beginning to bear fruit. Other common species are *Populus heterophylla*, *Quercus prinus*, *Q. lyrata*, *Q. palustris*, *Q. rubra*, *Carya laciniosa*, *Liquidambar Styraciflua*, *Gleditsia aquatica*, *Fraxinus pennsylvanica* var. *lanceolata*, *Acer rubrum*, *Itea virginica*, *Cornus femina* and *Cephalanthus occidentalis*.

We began this morning by having a puncture while going over a piece of road newly surfaced with coarse gravel, and on account of the rough going we did not discover it until the tube was ruined. This afternoon we got the car mired in trying to straddle a mud hole and spent a couple of hours extricating it, which we did only after

carrying quantities of flat rocks from a hillside to build up as we pried the wheels out, since it was impossible to use the jack. This took so long that by the time we had the car out and loaded again it was too late to go over to the interesting hills, which here form the extreme northern end of Crowley's Ridge, and which I had hoped to photograph. However, we climbed one of the nearest and examined the flora. This is close to the little town of Perkins, Scott County. The hills, rising abruptly from the surrounding lowlands here have a remarkable appearance, made more striking by the fact that while the bottoms have been mostly cleared for cultivation, these ridges are still heavily wooded. Many of the Beech, Oak, Hickory and other trees attain a large size. I photographed one large specimen of Beech and a King-nut tree, the trunks of which had grown together, apparently forming two halves of a composite trunk, for several feet above the base. This is the only part of Crowley's Ridge where I have seen outcrops of stratified rock, the usual gravel and clay deposits here having covered some remnants of the hard Ordovician dolomite, which is being excavated by erosion and is beginning to appear as cliffs and ledges in a few places.

Hugo, Okla., May 26th.

Our camp last night was in a beautiful and rugged part of the Ozarks, a few miles from the little town of Talihina, Oklahoma. After breakfast this morning I started out for a walk of several miles over the steep dividing ridges and deep hollows that, viewed from a high point, extend as far as can be seen in all directions. The prevailing geological formation is Pennsylvanian sandstone, varying greatly in stratification and density at different places. Most of the country is still heavily wooded with a mixed forest of Pine (*Pinus echinata*) and deciduous species of Oaks and Hickories prevailing on the ridges, and many other trees and shrubs along escarpments and ravines and in the deep narrow valleys. Some of the species found in such places are *Juniperus virginiana*, *Castanea ozarkensis*, *Quercus borealis* var. *maxima*, *Q. Shumardii* var. *Schneckii*, *Ulmus alata*, *Nyssa sylvatica*, *Amelanchier canadensis*, *Acer rubrum*, *A. saccharum*, *Cornus obliqua*, *Vitis aestivalis* and *V. rupestris*. Along the rocky margins of a mountain creek I also collected *Carpinus caroliniana*, *Rubus flagellaris*, *Ceanothus ovatus*, *Hypericum oklahomense*, *Mitchella repens*, *Amorpha fruticosa* and another species of *Amorpha*, somewhat resembling *A. glabra*, but with slightly pubescent foliage and branches, which I do not recognize.

In places along moderate slopes hard beds of the sandstone come to the surface, forming glades or barrens, conspicuous in the

forest for the absence of trees. I stopped to examine and to take some photographs in one of these, which was several acres in extent. Conspicuous amongst the large number of herbaceous species here were *Cheilanthes lanosa*, *Camassia esculenta*, *Delphinium azureum*, *Talinum teretifolium*, *Tephrosia virginiana*, *Tragia nepetifolia*, *Ptilimnium Nuttallii*, *Spermolepis echinata*, *Opuntia humifusa*, *Hedeoma hispida*, *Kneiffia linifolia*, *Pentstemon arkansanus*, *Ruellia ciliosa*, *Specularia leptostachya*, *Coreopsis grandiflora* (not yet in bloom), *Thelesperma trifidum*, *Echinacea angustifolia* and *Krigia occidentalis*.

In the afternoon I stopped along a little creek near the village of Finley to photograph some fine blooming specimens of *Yucca arkansana*. A little further on, along the bluffs and banks of Mill Creek, I collected *Tilia floridana*, *Chionanthus virginica*, *Castanea ozarkensis*, and *Amorpha nitens*. A few miles farther south, near Kaimichi, along the bed of a little mountain creek, I found *Salix petiolaris*, *Andrachne phyllanthoides*, and a curious and unknown form of Witch Hazel. This seems to be quite an extension southward of the known range of *Salix petiolaris*, which was previously known from Canada to northeastern Missouri.

The *Hamamelis* is evidently closely related to the spring-blooming species, *H. vernalis*, which is so abundant along the rocky streams of the Ozark region. Although the plants here are smaller than the average for *Hamamelis vernalis*, they have the characteristic stoloniferous habit of that species as well as the rather thick upright leaves of similar type. A form of this species, with slightly tomentulose branches and leaves more or less pubescent along the veins beneath, has been described by Mr. Alfred Rehder as *Hamamelis vernalis* forma *tomentella* †. The type specimen of this form came from Potean, Oklahoma, which is in the same general regions as Kaimichi, and it is also in cultivation at the Arnold Arboretum. However, the Kaimichi plants are so different not only from the typical form of *Hamamelis vernalis* but also from the forma *tomentella* that they can scarcely be regarded as a mere form and be referred to the latter. The leaves are thickly coated beneath with a persistent close felty pubescence, often tawny or reddish along the petioles and veins, and with scattered grayish stellate hairs on the upper surface. The branchlets are also copiously villous-tomentose.

In the original description of *Hamamelis vernalis*[1] Professor Sargent states that the leaves are either glabrous or stellate pubescent on both surfaces, and specimens that he has noted as included in his type material scarcely differ from the type specimen of the

[1] Sargent, Trees and Shrubs, II. 137 (1911).

forma *tomentella*. The foliage of the plants found near Talihina is so different that they appear more distinct than any American species that has been distinguished since the publication of *Hamamelis virginiana*. But since a name has already been given to a tomentulose form of *H. vernalis*, to which this plant is clearly related and since it is likely that other intermediates will be found it is perhaps best to regard all of the tomentose forms as one variety, and I am therefore calling the pubescent plants *Hamamelis vernalis* var. *tomentella*.[1]

About Antlers, Oklahoma, the soil of the uplands is extremely sandy. *Quercus cinerea* grows in such soil, and I found it near here several years ago, but did not see it today. *Crataegus pilifera* is growing here as a small tree 4–5 m. tall, and *C. uniflora* as a slender shrub scarcely a meter tall, but in abundant fruit. *Jatropha texana*, *Lithospermum Gmelini* and *Pentstemon pauciflorus* were also collected in the sandy open woods.

As we approached Hugo there was a marked change in the character of the country and in the flora. Cretaceous limestone comes to the surface in many places and the soil resulting from it is a stiff black gumbo, which is quite fertile, as shown by the better quality of farm improvements and other evidences of prosperity. Woods are confined largely to the vicinity of the streams, with broad stretches of upland prairie, and glades are frequent on limestone outcrops. *Maclura pomifera* is native here, and the little wild Rose *Rosa foliolosa* is abundant. There is also a great profusion of wild flowers in rainy seasons. *Pentstemon Cobaea*, and *Petalostemon albidus* are conspicuous and I also collected the little suffrutescent *Phyllanthus polygonoides*.

Stillwater, Okla., May 28th.

We pitched our tent last night along a pretty little stream, Pennington Creek, near Tishomingo, the county seat of Johnston County and formerly the capitol of the Chickisaw Indian tribe. There is an outcrop of granite in this section, and the creek has cut its channel through the hard igneous rocks, great masses of which lie scattered about, piled up and eroded into the most

[1] **Hamamelis vernalis** var. **tomentella** (Rehder), comb. nov.
Hamamelis vernalis f. *tomentella* Rehder in Jour. Arnold Arb. 1. 256 (1920).
A typo differt foliis supra stellato-pubescentibus, infra glaucescentibus dense stellato-pubescentibus; petiolis nervisque fulvo-pubescentibus. Ramuli juveniles dense fulvo-stellato-pubescentes.
Near Kaimichi, Pushmataha County, Oklahoma, *E. J. Palmer*, no. 39394, May 26, 1931.
The plant here described differs from the form distinguished as f. *tomentella* in being densely felty-tomentose on the under surface of the leaves instead of sparsely stellate-pubescent, and also in the more densely pubescent young branchlets.